



STIC Search Report

EIC 2100

STIC Database Tracking Number: 195546

TO: Marilyn Nguyen
Location: RND 3c19
Art Unit: 2163
Tuesday, July 25, 2006

Case Serial Number: 10/669749

From: Byron T. Mims
Location: EIC 2100
RND-4B19
Phone: 272-3528

byron.mims@uspto.gov

Search Notes

Merilyn

Enclosed are art findings that may be of interest. I took the liberty of flagging as well as highlighting some that I felt would be of direct relevance. However, you might want to look at some of the others in the event that your vantage point may provide you with the ability to see great pertinence in some of the others. Let me know if there is anything in particular that you would like for me to pursue further.

Byron



RECEIVED
JUL 13 2006

Access DB# 195546

SEARCH REQUEST FORM

BY:

Scientific and Technical Information Center

64

Requester's Full Name: MERILYN NGUYEN Examiner #: 79389 Date: 07-13-2006
Art Unit: 2163 Phone Number 301-571-272-4026 Serial Number: 10/669 749
Mail Box and Bldg/Room Location: RAN 3019 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Query transformation for union all view join queries using join predicates
Inventors (please provide full names): Yao-Ching S. Chen, Ding-Wei L. Chieh, Hsiung T. Trar
Yumi K. Tsuji, and Guogen Zhang
Earliest Priority Filing Date: 09/24/2003

**For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

Method of optimizing a query in a computer system by combining join predicates from a query with local predicates from each branch of one or more UNION ALL views and generate the join except when the combined predicates are always FALSE and the join generates an empty result. Which are indicated by analysis process.
→ Advantage: to eliminate the need to evaluate the empty joins at run time.

* Predicates are always FALSE: means predicates are contradictory

prior art: Cheng 5,963,933
Total 5,822,750

STIC Search Results Feedback Form

EIC 2100

Questions about the scope or the results of the search? Contact *the EIC searcher* or contact:

Alyson Dill, EIC 2100 Team Leader
272-3527, RND 4B28

Voluntary Results Feedback Form

➤ I am an examiner in Workgroup: Example: 2133

➤ Relevant prior art **found**, search results used as follows:

- ☐ 102 rejection
- ☐ 103 rejection
- ☐ Cited as being of interest.
- ☐ Helped examiner better understand the invention.
- ☐ Helped examiner better understand the state of the art in their technology.

Types of relevant prior art found:

- ☐ Foreign Patent(s)
- ☐ Non-Patent Literature
(Journal articles, conference proceedings, new product announcements etc.)

➤ Relevant prior art **not found**:

- ☐ Results verified the lack of relevant prior art (helped determine patentability).
- ☐ Results were not useful in determining patentability or understanding the invention.

Comments:

Drop off or send completed forms to STIC/EIC2100 RND, 4B28

2/25/06

Set	Items	Description
S1	9389	AU=(CHEN Y? OR CHEN, Y?)
S2	2	AU=(CHIEH D? OR CHIEH, D?)
S3	572	AU=(TRAN H? OR TRAN, H?)
S4	4119	AU=(TSUJI Y? OR TSUJI, Y?)
S5	2725	AU=(ZHANG G? OR ZHANG, G?)
S6	1	(YAOCHING OR YAO()CHING)(2N)CHEN OR (DINGWEI OR DING()WEI) - (2N)CHIEH OR TRAN(2N)HUONG OR YUMI(2N)TSUJI OR GUOGEN(2N)ZHANG
S7	63	JOIN()PREDICAT?
S8	59	UNION()ALL()VIEW??? ? OR UNIONALLVIEW??? ? OR UNIONALL()VI- EW??? ? OR UNION()ALL? ? OR UNIONALL?
S9	18	LOCAL()PREDICAT?
S10	1259	QUER??? ?(10N)OPTIMIZ?
S11	1484013	IC=G06F?
S12	1038750	MC=T01?
S13	1	S1 AND S2 AND S3 AND S4 AND S5
S14	2	S13 OR S6
S15	9	S1:S6 AND S7:S10
S16	10	S14:S15
S17	10	IDPAT (sorted in duplicate/non-duplicate order)
File 347:JAPIO Dec 1976-2005/Dec(Updated 060404)		
(c) 2006 JPO & JAPIO		
File 348:EUROPEAN PATENTS 1978-2006/ 200629		
(c) 2006 European Patent Office		
File 349:PCT FULLTEXT 1979-2006/UB=20060720,UT=20060713		
(c) 2006 WIPO/Univentio		
File 350:Derwent WPIX 1963-2006/UD=200646		
(c) 2006 The Thomson Corporation		

Yours App).

17/3,K/2 (Item 2 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2006 The Thomson Corporation. All rts. reserv.

0014905071 - Drawing available
WPI ACC NO: 2005-252849/200526
XRPX Acc No: N2005-208131

Query optimization method in personal computer, involves analyzing combined predicates and not joining join predicates with local predicates when analyzed combined predicates lead to empty result

Patent Assignee: INT BUSINESS MACHINES CORP (IBMC)

Inventor: CHEN Y S ; CHIEH D L ; TRAN H T ; TSUJI Y K ; ZHANG G

Patent Family (1 patents, 1 countries)

Patent Number	Kind	Date	Application Number	Kind	Date	Update
US 20050065926	A1	20050324	US 2003669749	A	20030924	200526 B

Priority Applications (no., kind, date): US 2003669749 A 20030924

Patent Details

Number	Kind	Lan	Pg	Dwg	Filing	Notes
US 20050065926	A1	EN	14	6		

Query optimization method in personal computer, involves analyzing combined predicates and not joining join predicates with local predicates when analyzed combined predicates lead to empty result

Inventor: CHEN Y S ...

... CHIEH D L ...

... TRAN H T ...

... TSUJI Y K ...

... ZHANG G

Alerting Abstract ...NOVELTY - The join predicates from a query are combined with local predicates from UNION ALL views referred by a query and the combined predicates are analyzed. When the combined predicates lead to an empty result, the joined predicates are not joined with local predicates . . . query optimizing device; and article of manufacture comprising computer readable medium storing query optimization program...

...USE - For optimizing query in computer systems such as personal computer, mainframe computer and minicomputer for retrieving data...

...ADVANTAGE - The query is optimized efficiently since the need to evaluate the empty join during runtime is eliminated

Original Publication Data by Authority

Original Titles:

Query transformation for union all view join queries using join predicates for pruning and distribution

Inventor name & address:

Chen, Yao-Ching S ...

... Chieh, Ding-Wei L ...

... Tran, Huong T ...

... Tsuji, Yumi K ...

... Zhang, Guogen

Original Abstracts:

A method, apparatus, and article of manufacture for **optimizing a query** in a computer system, wherein the **query** is performed by the computer system to retrieve data from a database stored on the computer system. The **optimization** includes: (a) combining **join predicates** from a **query** with **local predicates** from each branch of one or more **UNION ALL views** referenced by the query; (b) analyzing the combined predicates; and (c) not generating the join...

Claims:

What is claimed is: b 1 /b . A method of **optimizing a query** in a computer system, the **query** being performed by the computer system to retrieve data from a database stored on the computer system, the method comprising: (a) combining **join predicates** from a query with **local predicates** from each branch of one or more **UNION ALL views** referenced by the query; (b) analyzing the combined predicates; and (c) not generating the join...

**Your Assignee & some
INV.**

17/3,K/3 (Item 3 from file: 350)
DIALOG(R) File 350:Derwent WPIX
(c) 2006 The Thomson Corporation. All rts. reserv.

0014803780 - Drawing available
WPI ACC NO: 2005-151466/200516
XRPX Acc No: N2005-127790

Query optimization method in computer system, involves maintaining group by clause with grouping sets and rollup/cube operations, in original form after query rewrite, during query compilation and translating maintained clause

Patent Assignee: INT BUSINESS MACHINES CORP (IBMC)
Inventor: CHEN Y S ; HU J; LIN F; WANG Y; YUKI G M; ZHANG G
Patent Family (1 patents, 1 countries)

Patent			Application			
Number	Kind	Date	Number	Kind	Date	Update
US 20050027690	A1	20050203	US 2003629459	A	20030729	200516 B

Priority Applications (no., kind, date): US 2003629459 A 20030729

Patent Details

Number	Kind	Lan	Pg	Dwg	Filing	Notes
US 20050027690	A1	EN	17	6		

Query optimization method in computer system, involves maintaining group by clause with grouping sets and rollup/cube...
Inventor: CHEN Y S ...

... ZHANG G

Alerting Abstract ... query optimizing device; and article of manufacture comprising computer readable medium storing query optimization program...

...USE - For optimizing queries such as structured query language (SQL) query in relational database management system, using computer systems such as mainframe computer, minicomputer and personal...

...ADVANTAGE - The query is optimized efficiently within minimum time by reducing the generation number of workfiles during optimization

Original Publication Data by Authority

Inventor name & address:
Zhang, Guogen ...

... Chen, Yao-Ching S

Original Abstracts:

A method, apparatus, and article of manufacture for optimizing a query in a computer system. During compilation of the query, a GROUP BY clause with one or more GROUPING SETS, ROLLUP or CUBE operations is...

...an input to a grouping set on a next one of the levels. Finally, a UNION ALL operation is performed on the grouping sets.

Claims:

What is claimed is: b 1 /b . A method of optimizing a query in a computer system, the query being performed by the computer system to retrieve data from a database stored on the...

your Assignee & 1 INV

17/3,K/4 (Item 4 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2006 The Thomson Corporation. All rts. reserv.

0014328926 - Drawing available
WPI ACC NO: 2004-516682/200449
XRPX Acc No: N2004-409424

Query optimizing method in computer system, involves rewriting query based on matched grouping of materialized view with grouping of query performed by computer system, using column equivalence and functional dependency

Patent Assignee: INT BUSINESS MACHINES CORP (IBMC)

Inventor: LI R; LIU L H; WANG Y; ZHANG G

Patent Family (1 patents, 1 countries)

Patent Number	Kind	Date	Application Number	Kind	Date	Update
US 20040122814	A1	20040624	US 2002322977	A	20021218	200449 B

Priority Applications (no., kind, date): US 2002322977 A 20021218

Patent Details

Number	Kind	Lan	Pg	Dwg	Filing	Notes
US 20040122814	A1	EN	19	4		

Query optimizing method in computer system, involves rewriting query based on matched grouping of materialized view with grouping of query performed by computer system...

...Inventor: ZHANG G

Alerting Abstract ... query optimizing apparatus; and article of manufacture comprising computer readable medium storing query optimizing program...

...USE - For optimizing query in computer system e.g. personal computer (PC), mainframe and minicomputer...

...ADVANTAGE - Efficiently optimizes the query in computer system, by simple technique

Original Publication Data by Authority

Inventor name & address:

Zhang, Guogen ...

Original Abstracts:

A method, apparatus, and article of manufacture for optimizing a query in a computer system, wherein the query is performed by the computer system to retrieve data from a database stored on the...

Claims:

What is claimed is: b 1 /b . A method of optimizing a query in a computer system, the query being performed by the computer system to retrieve data from a database stored on the...

* A&I

17/3,K/5 (Item 5 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2006 The Thomson Corporation. All rts. reserv.

0013351910 - Drawing available
WPI ACC NO: 2003-439775/200341
XRPX Acc No: N2003-350964

Database query processing method for relational database management system,
involves applying set operator on two intermediate result tables obtained
by performing query operation on each input table separately

Patent Assignee: INT BUSINESS MACHINES CORP (IBMC)

Inventor: CHEN Y C S ; STEPHEN CHEN Y C; TSUJI Y K ; WANG Y; ZHANG G

Patent Family (2 patents, 1 countries)

Patent			Application			
Number	Kind	Date	Number	Kind	Date	Update
US 20030055814	A1	20030320	US 2001896453	A	20010629	200341 B
US 6792420	B2	20040914	US 2001896453	A	20010629	200460 E

Priority Applications (no., kind, date): US 2001896453 A 20010629

Patent Details

Number	Kind	Lan	Pg	Dwg	Filing	Notes
US 20030055814	A1	EN	15	6		

Inventor: CHEN Y C S ...
... TSUJI Y K ...

... ZHANG G

Original Publication Data by Authority

Original Titles:

Method, system, and program for optimizing the processing of queries
involving set operators...

...Method, system, and program for optimizing the processing of queries
involving set operators

Inventor name & address:

Chen, Yao Ching Stephen ...

... Tsuji, Yumi Kimura ...

... Zhang, Guogen ...

... Tsuji, Yumi Kimura ...

... Zhang, Guogen

*A&I

17/3,K/6 (Item 6 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2006 The Thomson Corporation. All rts. reserv.

0012823209 - Drawing available
WPI ACC NO: 2002-680899/200273
XRPX Acc No: N2002-537390

Query optimization method for relational database management system,
involves dividing overall access path selection into smaller access path
selections that are processed separately by join enumerator

Patent Assignee: INT BUSINESS MACHINES CORP (IBMC)

Inventor: CHEN Y S ; LIN F; MUKAI J; TIE H; WANG Y

Patent Family (1 patents, 1 countries)

Patent Application

Number	Kind	Date	Number	Kind	Date	Update
US 6421663	B1	20020716	US 1999332600	A	19990614	200273 B

Priority Applications (no., kind, date): US 1999332600 A 19990614

Patent Details

Number	Kind	Lan	Pg	Dwg	Filing	Notes
US 6421663	B1	EN	14	8		

Query optimization method for relational database management system,
involves dividing overall access path selection into smaller access...
Inventor: CHEN Y S ...

Alerting Abstract ... Query optimization apparatus; and Article of
manufacture comprising recorded medium storing query optimization
program...

...USE - For optimizing query for relational database management system
of computer system...

...ADVANTAGE - Optimizes joined table expressions and complex join
operations of the query effectively using access path selections

Original Publication Data by Authority

Inventor name & address:

Chen, Yao-Ching Stephen ...

Original Abstracts:

...article of manufacture for analyzing a query and extending an access
path selection for the query, in order to optimize joined table
expressions and complex join operations in the query. The extension of
the access path selection occurs in two phases: (1) an access path...

...and complex join operators, wherein the join enumerator can be
continuously enhanced as more powerful query optimization techniques
become available.

Claims:

A method of optimizing a query in a relational database management
system, comprising: (a) dividing the query into separate portions in...

* A&I

17/3,K/7 (Item 7 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2006 The Thomson Corporation. All rts. reserv.

0012656898 - Drawing available
WPI ACC NO: 2002-506609/
XRPX Acc No: N2002-400785

Query optimization method for relational database management system,
involves transforming joined table expressions by simplifying joins, when
non-null predicate references null-supplying side of joined table
expression

Patent Assignee: INT BUSINESS MACHINES CORP (IBMC)
Inventor: CHEN Y S ; LIN F; MUKAI J; TIE H; WANG Y
Patent Family (1 patents, 1 countries)

Patent	Application
Number	Kind Date Number Kind Date Update
US 6385603	B1 20020507 US 1999332544 A 19990614 200254 B

Priority Applications (no., kind, date): US 1999332544 A 19990614

Patent Details

Number	Kind	Lan	Pg	Dwg	Filing	Notes
US 6385603	B1	EN	13	4		

Query optimization method for relational database management system,
involves transforming joined table expressions by simplifying joins, when
...
Inventor: CHEN Y S ...

Alerting Abstract DESCRIPTION - An INDEPENDENT CLAIM is included for
query optimization apparatus...

...ADVANTAGE - Optimizes joined table expressions and complex join
operations by query transformations...

...DESCRIPTION OF DRAWINGS - The figure shows a flowchart explaining the
SQL queries optimizing method.

Original Publication Data by Authority

Original Titles:

Joined table expression optimization by query transformation.
Inventor name & address:
Chen, Yao-Ching Stephen ...

Original Abstracts:

A query optimizer analyzes a query and triggers a sequence of
transformations to achieve optimal performance for joined table
expressions. The...

Claims:

A method of optimizing a query in a relational database management
system, comprising:(a) analyzing the query to determine whether it...

* A&I

17/3,K/10 (Item 10 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS
(c) 2006 European Patent Office. All rts. reserv.

01751357

ANNOTATED AUTOMATON ENCODING OF XML SCHEMA FOR HIGH PERFORMANCE SCHEMA
VALIDATION

KODIERUNG VON XML-SCHEMATA IN ANNOTIERTE AUTOMATEN FUR
HOCHLEISTUNGSSCHEMAVALIDIERUNG

CODAGE DE SCHEMA XML PAR AUTOMATE AVEC ANNOTATIONS PERMETTANT UNE
VALIDATION DE SCHEMA HAUTEMENT PERFORMANTE

PATENT ASSIGNEE:

International Business Machines Corporation, (200120), New Orchard Road,
Armonk, N.Y. 10504, (US), (Applicant designated States: all)

INVENTOR:

FUH, You-Chin, 1140 Queen Anne Drive, San Jose, CA 95129, (US)

WANG, Ning, 5623 Verano Place, Irvine, CA 92612, (US)

WANG, Yun, 20758 Maureen Way, Saratoga, CA 95070, (US)

ZHANG , Guogen , 5614 Calmor Ave No 4, San Jose, CA 95123, (US)

LEGAL REPRESENTATIVE:

Williams, Julian David (75461), IBM United Kingdom Limited Intellectual
Property Department Mail Point 110 Hursley Park Winchester,,
Hampshire SO21 2JN, (GB)

PATENT (CC, No, Kind, Date): EP 1573519 A2 050914 (Basic)
WO 2004036417 040429

APPLICATION (CC, No, Date): EP 2003758311 031011; WO 2003GB4434 031011

PRIORITY (CC, No, Date): US 418673 P 021015; US 418658 030416

DESIGNATED STATES: AT; BE; BG; CH; CY; CZ; DE; DK; EE; ES; FI; FR; GB; GR;
HU; IE; IT; LI; LU; MC; NL; PT; RO; SE; SI; SK; TR

EXTENDED DESIGNATED STATES: AL; LT; LV; MK

INTERNATIONAL PATENT CLASS (V7): G06F-009/40

NOTE:

No A-document published by EPO

LANGUAGE (Publication,Procedural,Application): English; English; English

INVENTOR:

... US)

ZHANG , Guogen ,

Set	Items	Description
S1	36	JOIN() PREDICAT?
S2	10	UNION() ALL() VIEW??? ? OR UNION() ALL
S3	1	S2(10N) (LOCAL() PREDICAT?)
S4	1	S1 AND S2
S5	1	S3:S4
S6	10	S2:S5

File 350:Derwent WPIX 1963-2006/UD=200646

(c) 2006 The Thomson Corporation

File 347:JAPIO Dec 1976-2005/Dec(Updated 060404)

(c) 2006 JPO & JAPIO

Your Appl. & Inv

6/3,K/6 (Item 6 from file: 350)
DIALOG(R) File 350:Derwent WPIX
(c) 2006 The Thomson Corporation. All rts. reserv.

0014905071 - Drawing available
WPI ACC NO: 2005-252849/200526
XRPX Acc No: N2005-208131

Query optimization method in personal computer, involves analyzing combined predicates and not joining join predicates with local predicates when analyzed combined predicates lead to empty result

Patent Assignee: INT BUSINESS MACHINES CORP (IBMC)

Inventor: CHEN Y S; CHIEH D L; TRAN H T; TSUJI Y K; ZHANG G

Patent Family (1 patents, 1 countries)

Patent Number	Kind	Date	Application Number	Kind	Date	Update
US 20050065926	A1	20050324	US 2003669749	A	20030924	200526 B

Priority Applications (no., kind, date): US 2003669749 A 20030924

Patent Details

Number	Kind	Lan	Pg	Dwg	Filing	Notes
US 20050065926	A1	EN	14	6		

Query optimization method in personal computer, involves analyzing combined predicates and not joining join predicates with local predicates when analyzed combined predicates lead to empty result

...NOVELTY - The join predicates from a query are combined with local predicates from UNION ALL views referred by a query and the combined predicates are analyzed. When the combined predicates lead...

Original Publication Data by Authority

Original Titles:

Query transformation for union all view join queries using join predicates for pruning and distribution

Original Abstracts:

...retrieve data from a database stored on the computer system. The optimization includes: (a) combining join predicates from a query with local predicates from each branch of one or more UNION ALL views referenced by the query; (b) analyzing the combined predicates; and (c) not generating the join...

Claims:

...retrieve data from a database stored on the computer system, the method comprising: (a) combining join predicates from a query with local predicates from each branch of one or more UNION ALL views referenced by the query; (b) analyzing the combined predicates; and (c) not generating the join...

6/3,K/9 (Item 9 from file: 350)

DIALOG(R)File 350:Derwent WPIX

(c) 2006 The Thomson Corporation. All rts. reserv.

0013214759 - Drawing available

WPI ACC NO: 2003-299328/

XRPX Acc No: N2003-238107

Query processing method for ad-hoc analysis and data mining applications, involves inserting child group by operators to union nodes of query tree so as to summarize separate database tables in parallel

Patent Assignee: SYBASE INC (SYBA-N)

Inventor: KIRK S A; LI X; MACNICOL R D

Patent Family (2 patents, 1 countries)

Patent			Application			
Number	Kind	Date	Number	Kind	Date	Update
US 20020198872	A1	20021226	US 2001300234	P	20010621	200329 B
			US 200268253	A	20020204	
US 6691101	B2	20040210	US 200268253	A	20020204	200413 E

Priority Applications (no., kind, date): US 2001300234 P 20010621; US 200268253 A 20020204

Patent Details

Number	Kind	Lan	Pg	Dwg	Filing	Notes
US 20020198872	A1	EN	30	6	Related to Provisional US 2001300234	

Original Publication Data by Authority

Original Titles:

Database system providing optimization of group by operator over a **union all**

...

...Database system providing optimization of group by operator over a **union all**

Set	Items	Description
S1	27	JOIN() PREDICAT?
S2	49	UNION() ALL() VIEW??? ? OR UNION() ALL
S3	6	S1(5N) (AFFILIAT? OR ASSOCIAT? OR BOUND? OR CONNECT? OR LIN- K? OR COOPERAT? OR CORRELAT? OR RELAT?)
S4	27	S1(5N) (COMBIN? OR CONJUNCT? OR PARTNER? OR COUPL? OR JOIN? OR CORRESPOND? OR SPONSOR? OR ATTACH?)
S5	0	S3:S4(100N) S2
S6	0	S1(100N) S2
S7	35	S2 NOT (AD>2003 OR AD=2004:2006)
S8	3	S7 AND (QUER??? ?() OPTIMIZ?)
S9	32	S7 NOT S8

File 348:EUROPEAN PATENTS 1978-2006/ 200629

(c) 2006 European Patent Office

File 349:PCT FULLTEXT 1979-2006/UB=20060720,UT=20060713

(c) 2006 WIPO/Univentio

8/3,K/1 (Item 1 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS
(c) 2006 European Patent Office. All rts. reserv.

01360830

Relation interval tree

Baum zum Indizieren von Zeitabstanden fur relationale Datenbanken

Arbre d'indexation d'intervalles dans des bases de donnees relationnelles

PATENT ASSIGNEE:

Seidl, Thomas, Dr., (3038810), Jagerstrasse 11, 82008 Unterhaching, (DE),
(Applicant designated States: all)

Potke, Marco, (3038840), Herzogstandstrasse 1, 81541 Munchen, (DE),
(Applicant designated States: all)

Kriegel, Hans-Peter, Prof.Dr., (3038850), Nurnberger Strasse 21, 86399
Bobingen, (DE), (Applicant designated States: all)

INVENTOR:

Seidl, Thomas, Dr., Jagerstrasse 11, 82008 Unterhaching, (DE)

Potke, Marco, Herzogstandstrasse 1, 81541 Munchen, (DE)

Kriegel, Hans-Peter, Prof.Dr., Nurnberger Strasse 21, 86399 Bobingen,
(DE)

PATENT (CC, No, Kind, Date): EP 1160682 A1 011205 (Basic)

APPLICATION (CC, No, Date): EP 2000112031 000602;

DESIGNATED STATES: AT; BE; CH; CY; DE; DK; ES; FI; FR; GB; GR; IE; IT; LI;
LU; MC; NL; PT; SE

EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI

INTERNATIONAL PATENT CLASS (V7): G06F-017/30

ABSTRACT WORD COUNT: 184

NOTE:

Figure number on first page: NONE

LANGUAGE (Publication,Procedural,Application): English; English; English

FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	200149	329
SPEC A	(English)	200149	8920
Total word count - document A			9249
Total word count - document B			0
Total word count - documents A + B			9249

...SPECIFICATION integrating the RI-Tree with the declarative SQL level as well as with the relational **query optimizer**.

Technically, the RI-tree manages intervals by two relational indexes. For storing n intervals, O...split the complex OR-query into a set of three simpler queries connected by a **UNION ALL** operator. The subqueries concerning leftNodes and rightNodes are efficiently supported by the respective indexes upperIndex...

8/3,K/2 (Item 1 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
(c) 2006 WIPO/Univentio. All rts. reserv.

00418777 **Image available**
METHOD AND SYSTEM FOR USING MATERIALIZED VIEWS TO EVALUATE QUERIES
INVOLVING AGGREGATION
PROCEDE ET SYSTEME UTILISANT DES VUES MATERIALISEES POUR EVALUER DES
REQUETES FAISANT INTERVENIR UNE LOGIQUE D'AGREGATION

Patent Applicant/Assignee:

AT & T CORP,

Inventor(s):

DAR Shaul,
JAGADISH Hosagrahar Visvesvaraya,
LEVY Alon Yitzchak,
SRIVASTAVA Divesh,

Patent and Priority Information (Country, Number, Date):

Patent: WO 9809238 A1 19980305

Application: WO 97US14660 19970819 (PCT/WO US9714660)

Priority Application: US 9624635 19960827; US 97895024 19970716

Designated States:

(Protection type is "patent" unless otherwise stated - for applications
prior to 2004)

CA JP AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE

Publication Language: English

Fulltext Word Count: 10757

Fulltext Availability:

Detailed Description

Detailed Description

... 1994; C. M. Chen and N. Roussopoulos, "The implementation and
performance evaluation of the ADMS **query optimizer** : Integrating query
result caching and matching", In Proc.

EDBT, 1994; S. Chaudhuri, R. Krishnamurthy, S...and aggregation, in the
presence of multiset tables. In addition to its obvious potential in
query optimization , this problem is important in many applications,
such as data warehousing, very large transaction recording...1990 would
have to access the Calls table, and the rewritten query Q;.

involves a **UNION ALL** .

Q;: SELECT Year, Plan-Name, SUM(Earnings)
FROM VI Calling Plans
WHERE VI Plan.Id...

...Plan.Id

AND Year.:@1995

GROUPBY Year, Plan-Name

HAVING SUM(Earnings) > 1, 000, 000

UNION ALL

SELECT Year, Plan-Name, SUM(Charge)

FROM Calls, Calling

Plans

WHERE Calls.Plan-Id = Calling...Q can be a single-block query, or a
multi-block query that is a **UNION ALL** of single-block queries. For
view V to be usable in answering query Q such...

...either be single-block queries (described below) or union multi-block queries that are the **UNION ALL** (i.e., additive multiset union) of single-block queries. A view is defined by a...query, whereas rewriting Q; in the same example is a multiblock query that is a **UNION ALL** of single-block queries.

Rewriting of a Query

A query Q is a rewriting of...

...V is usable in evaluating a given query Q - the rewritten query can be the **UNION ALL** of Q itself and a single-block query in which V occurs in the FROM...be a single-block query, but can be a multi-block query that is a **UNION ALL** of single-block queries, additional usage of views in evaluating queries are possible.

The conditions...that satisfied condition C 1 302 query Q can always be reformulated as a **UNION ALL** of 2 single-block queries Qa and Qb, that differ from Q (and from each...

...whether view V can be used to evaluate Qa. The reformulation of Q as the **UNION ALL** Of Qa and Qb, however, does not always preserve the semantics of Q. To preserve...

...the multi-block query Q that is the rewriting of Q using V is the **UNION ALL** of Q' a and Qb. Else Q is the same as Q',.

Theorem 3.2...

8/3,K/3 (Item 2 from file: 349)
DIALOG(R) File 349:PCT FULLTEXT
(c) 2006 WIPO/Univentio. All rts. reserv.

00303256 **Image available**
IMPROVED METHOD AND APPARATUS FOR DATA ACCESS IN MULTIPROCESSOR DIGITAL
DATA PROCESSING SYSTEMS
PROCEDE ET APPAREIL AMELIORES D'ACCES AUX DONNEES DANS DES SYSTEMES DE
DONNEES NUMERIQUES A PROCESSEURS MULTIPLES

Patent Applicant/Assignee:

KENDALL SQUARE RESEARCH CORPORATION,

Inventor(s):

REINER David,
MILLER Jeffrey M,
WHEAT David C,

Patent and Priority Information (Country, Number, Date):

Patent: WO 9521407 A2 19950810

Application: WO 95US1356 19950131 (PCT/WO US9501356)

Priority Application: US 94189497 19940131

Designated States:

(Protection type is "patent" unless otherwise stated - for applications
prior to 2004)

CA JP AT BE CH DE DK ES FR GB GR IE IT LU MC NL PT SE

Publication Language: English

Fulltext Word Count: 60951

Fulltext Availability:

Detailed Description

Claims

Detailed Description

... which is selected by the decomposer 74A based on the access strategy
chosen by the **query optimizer** portion 76B of the DBMS 76.

Those skilled in the art will appreciate that information...produced.

OBJECT SEARCH

OPERATION OPTIONS NAME ID PARENT ID COLUMNS

. ----
-----

SELECT 0

STATEMENT

KSR PARALLEL UNION ALL EMP I 0 20

EXECUTION

TABLE ACCESS FULL EMP ...partitions,

(2) Submitting subqueries to the DBMS and executing them in parallel,

(3) Avoiding excessive **query optimization** overhead for the multiple

subqueries, (4) Producing correctly-optimized access plans for the

multiple subqueries...

...should be consistent with ORACLE's version 7.0 language for passing
directives to the **query optimizer** .

It may also be possible for us to automate the choice of partitioning
table. This...but not exhaustive set of queries.

We assume the use of the ORACLE 7.0 **query optimizer** , but may not have

captured its exact behavior. Many of the same results could be...

Claim

- ... usage. table cardinalities, predicate selectivity, and join order and method must be obtained from the **query optimizer** to make decisions about decomposition strategy, such as choice of a partitioning table. Semantic information...the parsed query, or obtaining a parse tree with already-bound semantic information from the **query optimizer**, and translating that to our standardized Aform). It also permits us to expand our repertoire...
- ...gatheringanalyzing phase of query decomposition, and are the mechanism used for gathering information from the **query optimizer** and the data dictionary. This suggests that gatheringanalyzing rules can be divided into two classes...
- ...of the query. Probing queries also fall into two groups: those which gather information on **query optimizer** strategy and associated cardinality and selectivity estimates; and those which gather semantic information about objects...that query. This entire category of queries could be replaced by a call to the **query optimizer** to return a parse tree for the original query, to which the necessary semantic information ...
- ...in some cases to establish cross-references between the semantically-augmented parse tree and the **query optimizer** plan. These could be needed, for example, to determine which index name in the optimizer...query. In the simplest case, a single combining function is used to produce the logical " **union all** " of the separate parallel streams. More complex cases can involve multiple functions or queries working...where other pnode types can easily enough place results directly in the caller's buffer.
 - Union - All**
A **union - all** pnode returns, in arbitrary sequence, the result rows of all of its children. It has...
- ...sorted in the same collating sequence, into a continuous run of that sequence. Like the **union - all** pnode, it pulls all of its children asynchronously, but it must wait for all children...diagrams, a I 0 degree of parallelism of 4 is assumed in all examples.
 - Basic Union - All of Parallel Subcursors**
The simplest pnode tree type shown in Figure 36 - I can be...possible for Q6 and Q 1 2).
Each time the root requests a row, the **union - all** pnode returns the first available row from any of its children, until all children have...
- ...2 can be used for queries which could otherwise have been handled by a basic **union - all** tree, but for the addition of an order-by clause (e.g. Q7). The subcursor...
- ...value. The aggregate pnode returns a single row of final aggregate values when its child **union - all** pnode returns EOD, which happens when all of the latter's children have returned EOD...row per distinct 1 5 set of group column values per subcursor). Straightforward cases where **union - all** suffices as a combining fimction would be obvious candidates for a combining functions approach. For pnode could masquerade as the root pnode in the basic **union - all** tree (Figure 36 - 1). This tree structure could handle a wide variety of cases, depending...

...be I 0 no point in using a combining query for cases that the basic **union - all** tree could have handled without one). For example, the combining query could contain an ORDER...Operator

A SETOP represents a UNION, INTERSECT, or MINUS set operator.

Attributes:

Operator type (UNION, **UNION ALL**, INTERSECT, or MINUS). Pointers to two operands (QRYs or other SETOPs).

QRY: Query

A QRY...Pointer to psubqries. (NOTE: We doubt we need this here, because the

multiplexing pnode types, **UNION - ALL** and MERGE, contain arrays of pointers to psubqries. But if there's any need to...boundaries in a stream of rows already sorted on GROUP BY columns. 136

Multiplexing Pnodes - **Union - All** and Merge

The **union - all** and merge pnodes are each able to coordinate the retrieval of rows from an arbitrary number of psubqries. They differ in that the **union - all** pnode returns rows in arbitrary order, as they become available from different psubqries, while the...room for the qd row. 2.

Contents of QD row:

Operation KSR PARALLEL EXECUTION Options **UNION ALL**, MERGE, or AGGREGATION ID 1 Object name: name of partitioning table object owner: owner of...

Set	Items	Description
S1	91	JOIN() PREDICAT?
S2	143	UNION() ALL() VIEW??? ? OR UNION() ALL? ? OR UNIONALL() VIEW??? ?
S3	0	S2 (10N) (LOCAL() PREDICAT?)
S4	0	S1 AND S2
S5	1	S1 AND LOCAL() PREDICAT?
S6	25	S1:S2 AND QUER??? ? (5N) OPTIMIZ?
S7	23	S6 NOT (PY>2003 OR PY=2004:2006)
S8	12	RD (unique items)
S9	85696	AU=(CHEN Y? OR CHEN, Y?)
S10	0	AU=(CHIEH D? OR CHIEH, D?)
S11	2659	AU=(TRAN H? OR TRAN, H?)
S12	6724	AU=(TSUJI Y? OR TSUJI, Y?)
S13	22256	AU=(ZHANG G? OR ZHANG, G?)
S14	0	S9 AND S11 AND S12 AND S13
S15	0	S9:S13 AND S1:S2
S16	25	S9:S13 AND QUER??? ? (5N) OPTIMIZ?
S17	0	S16 AND S1:S2
S18	24	S16 NOT (PY>2003 OR PY=2004:2006)
S19	16	RD (unique items)
File	2:INSPEC	1898-2006/Jul W3 (c) 2006 Institution of Electrical Engineers
File	6:NTIS	1964-2006/Jul W3 (c) 2006 NTIS, Intl Cpyrght All Rights Res
File	8:EI	Compendex(R) 1970-2006/Jul W3 (c) 2006 Elsevier Eng. Info. Inc.
File	34:SciSearch(R)	Cited Ref Sci 1990-2006/Jul W3 (c) 2006 The Thomson Corp
File	35:Dissertation Abs Online	1861-2006/Jun (c) 2006 ProQuest Info&Learning
File	56:Computer and Information Systems Abstracts	1966-2006/Jul (c) 2006 CSA.
File	60:ANTE: Abstracts in New Tech & Engineer	1966-2006/Jul (c) 2006 CSA.
File	62:SPIN(R)	1975-2006/Apr W3 (c) 2006 American Institute of Physics
File	65:Inside Conferences	1993-2006/Jul 24 (c) 2006 BLDSC all rts. reserv.
File	94:JICST-EPlus	1985-2006/Apr W4 (c) 2006 Japan Science and Tech Corp(JST)
File	95:TEME-Technology & Management	1989-2006/Jul W4 (c) 2006 FIZ TECHNIK
File	99:Wilson Appl. Sci & Tech Abs	1983-2006/Jun (c) 2006 The HW Wilson Co.
File	111:TGG Natl. Newspaper Index(SM)	1979-2006/Jul 12 (c) 2006 The Gale Group
File	144:Pascal	1973-2006/Jul W1 (c) 2006 INIST/CNRS
File	239:Mathsci	1940-2006/Sep (c) 2006 American Mathematical Society
File	256:TecInfoSource	82-2006/Oct (c) 2006 Info.Sources Inc
File	434:SciSearch(R)	Cited Ref Sci 1974-1989/Dec (c) 2006 The Thomson Corp
File	583:Gale Group Globalbase(TM)	1986-2002/Dec 13 (c) 2002 The Gale Group

5/3,K/1 (Item 1 from file: 2)

DIALOG(R)File 2:INSPEC

(c) 2006 Institution of Electrical Engineers. All rts. reserv.

05864304 INSPEC Abstract Number: C9503-6160D-004

Title: On the estimation of join result sizes

Author(s): Swami, A.; Schiefer, K.B.

Author Affiliation: IBM Almaden Res. Center, San Jose, CA, USA

p.287-300

Editor(s): Jarke, M.; Bubenko, J.; Jeffrey, K.

Publisher: Springer-Verlag, Berlin, Germany

Publication Date: 1994 Country of Publication: West Germany xi+406

pp.

ISBN: 3 540 57818 8

Conference Title: 4th International Conference on Extending Database Technology

Conference Date: 28-31 March 1994 Conference Location: Cambridge, UK

Language: English

Subfile: C

Copyright 1995, IEE

...Abstract: are determined for the join columns. The algorithm also takes into account the effect of **local predicates** on table and column cardinalities. These computations allow the correct selectivity values for each eligible **join predicate** to be computed. We show that the algorithm is correct and gives better estimates than...

...Identifiers: **local predicates** ; ...

...eligible **join predicate**

8/3,K/1 (Item 1 from file: 2)

DIALOG(R) File 2:INSPEC

(c) 2006 Institution of Electrical Engineers. All rts. reserv.

07613651 INSPEC Abstract Number: C2000-07-4250-012

Title: Optimization and evaluation of disjunctive queries

Author(s): Claussen, J.; Kemper, A.; Moerkotte, G.; Peithner, K.; Steinbrunn, M.

Author Affiliation: Passau Univ., Germany

Journal: IEEE Transactions on Knowledge and Data Engineering vol.12,
no.2 p.238-60

Publisher: IEEE,

Publication Date: March-April 2000 **Country of Publication:** USA

CODEN: ITKEEH **ISSN:** 1041-4347

SICI: 1041-4347(200003/04)12:2L:238:OEDQ;1-M

Material Identity Number: N571-2000-003

U.S. Copyright Clearance Center Code: 1041-4347/2000/\$10.00

Language: English

Subfile: C

Copyright 2000, IEE

Title: Optimization and evaluation of disjunctive queries

Abstract: It is striking that the **optimization** of disjunctive **queries** -i.e. those which contain at least one OR-connective in the query predicate-has...

... join operators that produce two output streams: the TRUE-stream with tuples satisfying the selection (join) **predicate** and the FALSE-stream with tuples not satisfying the corresponding predicate. Splitting the tuple streams...

Identifiers: disjunctive **query optimization** ;

8/3,K/2 (Item 2 from file: 2)

DIALOG(R) File 2:INSPEC

(c) 2006 Institution of Electrical Engineers. All rts. reserv.

07469318 INSPEC Abstract Number: C2000-02-4250-033

Title: Optimization of queries with user-defined predicates

Author(s): Chaudhuri, S.; Kyuseok Shim

Author Affiliation: Microsoft Res., Redmond, WA, USA

Journal: ACM Transactions on Database Systems vol.24, no.2 p.

177-228

Publisher: ACM,

Publication Date: June 1999 Country of Publication: USA

CODEN: ATDSD3 ISSN: 0362-5915

SICI: 0362-5915(199906)24:2L:177:OQWU;1-V

Material Identity Number: A316-2000-001

U.S. Copyright Clearance Center Code: 0362-5915/99/0600-0177\$05.00

Language: English

Subfile: C

Copyright 2000, IEE

Title: Optimization of queries with user-defined predicates

...Abstract: early as possible is no longer a sound heuristic. There are two previous approaches for **optimizing** such **queries**. However, neither is able to guarantee the optimal plan over the desired execution space. We ...

... algorithm of choice. Our optimization algorithms handle user-defined selections as well as user-defined **join predicates** uniformly. We present complexity analysis and experimental comparison of the algorithms.

Identifiers: **query optimization** ; ...

... **join predicates** ;

8/3,K/3 (Item 3 from file: 2)

DIALOG(R)File 2:INSPEC

(c) 2006 Institution of Electrical Engineers. All rts. reserv.

05999587 INSPEC Abstract Number: C9509-4250-003

Title: Hypergraph based reorderings of outer join queries with complex predicates

Author(s): Bhargava, G.; Goel, P.; Iyer, B.

Author Affiliation: Santa Teresa Lab., IBM Corp., San Jose, CA, USA

Journal: SIGMOD Record Conference Title: SIGMOD Rec. (USA) vol.24,
no.2 p.304-15

Publication Date: June 1995 Country of Publication: USA

CODEN: SRECD8 ISSN: 0163-5808

Conference Title: 1995 ACM SIGMOD International Conference on Management
of Data

Conference Sponsor: ACM

Conference Date: 22-25 May 1995 Conference Location: San Jose, CA, USA

Language: English

Subfile: C

Copyright 1995, IEE

...Abstract: are no usable results for reordering such operations for relations with duplicates and/or outer **join predicates** that are other than "simple". Most previous approaches have ignored duplicates and complex predicates; the...

... and algorithms for reordering such queries with joins and outer joins. As a result, the **query optimizer** can explore a significantly larger space of execution plans, and choose one with a low...

...Identifiers: **query optimizer** ;

8/3,K/4 (Item 4 from file: 2)

DIALOG(R)File 2:INSPEC

(c) 2006 Institution of Electrical Engineers. All rts. reserv.

05864304 INSPEC Abstract Number: C9503-6160D-004

Title: On the estimation of join result sizes

Author(s): Swami, A.; Schiefer, K.B.

Author Affiliation: IBM Almaden Res. Center, San Jose, CA, USA

p.287-300

Editor(s): Jarke, M.; Bubenko, J.; Jeffrey, K.

Publisher: Springer-Verlag, Berlin, Germany

Publication Date: 1994 Country of Publication: West Germany xi+406

pp.

ISBN: 3 540 57818 8

Conference Title: 4th International Conference on Extending Database Technology

Conference Date: 28-31 March 1994 Conference Location: Cambridge, UK

Language: English

Subfile: C

Copyright 1995, IEE

Abstract: Good estimates of join result sizes are critical for **query optimization** in relational database management systems. We address the problem of incrementally obtaining accurate and consistent...

... on table and column cardinalities. These computations allow the correct selectivity values for each eligible **join predicate** to be computed. We show that the algorithm is correct and gives better estimates than...

...Identifiers: **query optimization** ; ...

...eligible **join predicate**

8/3,K/5 (Item 5 from file: 2)

DIALOG(R) File 2:INSPEC

(c) 2006 Institution of Electrical Engineers. All rts. reserv.

05464152 INSPEC Abstract Number: C9310-6160D-001

Title: Predicate migration: optimizing queries with expensive predicates

Author(s): Hellerstein, J.M.; Stonebraker, M.

Author Affiliation: California Univ., Berkeley, CA, USA

Journal: SIGMOD Record vol.22, no.2 p.267-77

Publication Date: June 1993 Country of Publication: USA

CODEN: SRECD8 ISSN: 0163-5808

U.S. Copyright Clearance Center Code: 0 89791 592 5/93/0005/0267\$1.50

Conference Title: SIGMOD '93. 1993 ACM SIGMOD. International Conference on Management of Data

Conference Sponsor: ACM

Conference Date: 26-28 May 1993 Conference Location: Washington, DC, USA

Language: English

Subfile: C

Title: Predicate migration: optimizing queries with expensive predicates

Abstract: The traditional focus of relational **query optimization** schemes has been on the choice of join methods and join orders. Today's extensible...

... to define time-consuming functions, which may be used in a query's restriction and **join predicates**. Furthermore, SQL has long supported subquery predicates, which may be arbitrarily time-consuming to check. Thus restrictions should not be considered zero-time operations, and the model of **query optimization** must be enhanced. The authors develop a theory for moving expensive predicates in a query...

... well as results of their implementation in POSTGRES. Their experience with the newly enhanced POSTGRES **query optimizer** demonstrates that correctly **optimizing queries** with expensive predicates often produces plans that are orders of magnitude faster than plans generated by a traditional **query optimizer**. The additional complexity of considering expensive predicates during optimization is found to be manageably small.

Identifiers: relational **query optimization** ;

8/3,K/6 (Item 6 from file: 2)
DIALOG(R) File 2:INSPEC
(c) 2006 Institution of Electrical Engineers. All rts. reserv.

04554188 INSPEC Abstract Number: C90015078

Title: Automatic knowledge acquisition and maintenance for semantic query optimization

Author(s): Yu, C.T.; Sun, W.

Author Affiliation: Dept. of Electr. Eng. & Comput. Sci., Illinois Univ., Chicago, IL, USA

Journal: IEEE Transactions on Knowledge and Data Engineering vol.1, no.3 p.362-75

Publication Date: Sept. 1989 Country of Publication: USA

ISSN: 1041-4347

U.S. Copyright Clearance Center Code: 1041-4347/89/0900-0362\$01.00

Language: English

Subfile: C

Title: Automatic knowledge acquisition and maintenance for semantic query optimization

...Abstract: using newly acquired knowledge together with given semantic knowledge, it is possible to make the **query** processor and/or **optimizer** more intelligent so that future **queries** can b processed more efficiently. The acquired knowledge is in the form of constraints. While...
... the restriction (selection) closure, i.e. all deductible restrictions, from a given set of restrictions, **join predicates** (as given in a query), and constraints is given.

...Identifiers: semantic **query optimization** ; ...

... **join predicates**

8/3,K/7 (Item 7 from file: 2)

DIALOG(R) File 2:INSPEC

(c) 2006 Institution of Electrical Engineers. All rts. reserv.

02998414 INSPEC Abstract Number: C83010282

Title: Querying relational views of networks

Author(s): Rosenthal, A.; Reiner, D.

Author Affiliation: Sperry Res. Center, Sudbury, MA, USA

Conference Title: Proceedings of COMPSAC 82. IEEE Computer Society's
Sixth International Computer Software & Applications Conference p.571-80

Publisher: IEEE, New York, NY, USA

Publication Date: 1982 Country of Publication: USA xix+689 pp.

U.S. Copyright Clearance Center Code: CH1810-1/82/0000/0571\$00.75

Conference Date: 8-12 Nov. 1982 Conference Location: Chicago, IL, USA

Language: English

Subfile: C

...Abstract: SQL query against 'access relations' which are essentially
Codasyl records. Set links are represented by **join predicates**. A
slightly modified relational **query optimizer** is then used to produce an
access strategy for the query.

8/3,K/8 (Item 1 from file: 6)

DIALOG(R)File 6:NTIS

(c) 2006 NTIS, Intl Cpyrght All Rights Res. All rts. reserv.

1470968 NTIS Accession Number: N89-29079/5

Application of Constraints in Query Optimization

Vankuijk, H. J. A.

Technische Univ. Twente, Enschede (Netherlands). Dept. of Computer Science.

Corp. Source Codes: 090700004; U1294434

Sponsor: National Aeronautics and Space Administration, Washington, DC.

Report No.: MEMO-INF-88-55

1988 84p

Languages: English

Journal Announcement: GRAI9002; STAR2723

Order this product from NTIS by: phone at 1-800-553-NTIS (U.S. customers); (703)605-6000 (other countries); fax at (703)321-8547; and email at orders@ntis.fedworld.gov. NTIS is located at 5285 Port Royal Road, Springfield, VA, 22161, USA.

NTIS Prices: PC A05/MF A01

Application of Constraints in Query Optimization

... to a number of existing and new problems encountered during the overall process of (semantic) **query optimization** in (distributed) database systems. Domain constraints, attribute constraints, and tuple constraints are applied to explicitly...

... The context of the theory presented is found in the knowledge-based approach to semantic **query optimization** in a distributed environment and the explicit representation of **query optimization** knowledge of various sources so that it can be managed (added, deleted, modified). Constraints are...

...knowledge (including the so-called if-then rules known from literature), to augment selection and **join predicate** formulas to arrive at more efficient schedules for these operations, to define and apply horizontal...

Descriptors: *Constraints; *Distributed processing; * **Optimization** ; * **Query languages** ; *Semantics; Communication theory; Computer systems design; Computer systems performance; Data base management systems; Operating...

8/3,K/9 (Item 1 from file: 8)
DIALOG(R) File 8: Ei Compendex(R)
(c) 2006 Elsevier Eng. Info. Inc. All rts. reserv.

06353688 E.I. No: EIP03157433795

Title: Efficiently processing method for a specific kind of join predicates in ORDB

Author: Yang, Guo-Gui; Wu, Quan-Yuan

Corporate Source: Coll. of Comp. Natl. Univ. of Defence Technol.,
Changsha 410073, China

Source: Tien Tzu Hsueh Pao/Acta Electronica Sinica v 28 n 11 November
2000. p 111-113

Publication Year: 2000

CODEN: TTHPAG ISSN: 0372-2112

Language: Chinese

Title: Efficiently processing method for a specific kind of join predicates in ORDB

...Abstract: the basic operations in relational and object relational databases. In the case of relational, the **join predicate** is a Boolean expression consisting of arithmetic comparisons, and there are many high performance processing...

...in the case of object relational, user defined functions (UDFs) can be involved in the **join predicate**, and the UDF likes black boxes for the optimizer and execution engines, so the algorithms...

Descriptors: *Relational database systems; Object oriented programming;
Query languages; Boolean functions; Algorithms; Optimization

Identifiers: Object relational databases; **Join predicates**; Boolean expressions; User defined functions; Transforming functions; Sort merge algorithms; Hash join algorithms

8/3,K/10 (Item 2 from file: 8)
DIALOG(R)File 8: Ei Compendex(R)
(c) 2006 Elsevier Eng. Info. Inc. All rts. reserv.

04202790 E.I. No: EIP95072769189

Title: Algebraic transformation framework for multidatabase queries

Author: Lim, Ee-Peng; Srivastava, Jaideep; Hwang, San-Yih

Corporate Source: Nanyang Technological Univ, Singapore

Source: Distributed and Parallel Databases v 3 n 3 Jul 1995. p 273-307

Publication Year: 1995

CODEN: DPADEH ISSN: 0926-8782

Language: English

...Abstract: to include two-way outerjoins and GAD operations. The framework demonstrates that properties of selection/ **join predicates** and attribute derivative functions can be used to provide interesting transformation alternative. This framework also serves as a formal ground for developing **optimization** strategies for multidatabase **queries** . 15 Refs.

8/3,K/11 (Item 3 from file: 8)
DIALOG(R)File 8:Ei Compendex(R)
(c) 2006 Elsevier Eng. Info. Inc. All rts. reserv.

01226670 E.I. Monthly No: EIM8207-009798

Title: OPTIMIZATION STRATEGY FOR QUERY EVALUATION IN RDB/V1.

Author: Makinouchi, A.; Tezuka, M.; Kitakami, H.; Adachi, S.

Corporate Source: Fujitsu Lab Ltd, Kawasaki, Jpn

Conference Title: Proceedings - Very Large Data Bases, 7th International Conference on Very Large Data Bases.

Conference Location: Cannes, Fr **Conference Date:** 19810909

E.I. Conference No.: 00204

Source: Very Large Data Bases, International Conference on Very Large Data Bases 7th. Publ by IEEE Comput Soc Press (n 371), Los Alamitos, Calif, USA. Also available from IEEE Serv Cent (Cat n 81CH1701-2), Piscataway, NJ, USA p 518-529

Publication Year: 1981

CODEN: VLDBDP

Language: English

Title: OPTIMIZATION STRATEGY FOR QUERY EVALUATION IN RDB/V1.

Identifiers: OPTIMIZATION STRATEGY; QUERY EVALUATION; RELATIONAL DATA BASES; DATA BASE MANAGEMENT SYSTEMS; END USERS; HEURISTICS; DATA ORGANIZATION; RESTRICTIVE PREDICATE; JOIN PREDICATE ; ACCESS PATH SELECTION; STATISTICAL DATA

8/3,K/12 (Item 1 from file: 94)

DIALOG(R)File 94:JICST-EPlus

(c)2006 Japan Science and Tech Corp(JST). All rts. reserv.

01913474 JICST ACCESSION NUMBER: 94A0024172 FILE SEGMENT: JICST-E

Optimizing **Nested SQL** Queries .

SATO TAKASHI (1)

(1) Osaka Educational Univ.

Denshi Joho Tsushin Gakkai Gijutsu Kenkyu Hokoku(IEIC Technical Report
(Institute of Electronics, Information and Communication Enginners),
1993, VOL.93,NO.340(DE93 46-54), PAGE.17-24, FIG.5, TBL.1, REF.2

JOURNAL NUMBER: S0532BBG

UNIVERSAL DECIMAL CLASSIFICATION: 681.3:061.68

LANGUAGE: Japanese COUNTRY OF PUBLICATION: Japan

DOCUMENT TYPE: Journal

ARTICLE TYPE: Original paper

MEDIA TYPE: Printed Publication

Optimizing **Nested SQL** Queries .

ABSTRACT: SQL is a database language standardized in the world. In the
past, the **optimization** of nested **queries** described in SQL was
proposed. And its revisited version appeared already. This paper is re
...

...results. Detail cost analysis shows that algorithm is much efficient
especially when nested queries has **join predicate** other than
equality. (author abst.)

19/3,X/1 (Item 1 from file: 2)

DIALOG(R)File 2:INSPEC

(c) 2006 Institution of Electrical Engineers. All rts. reserv.

08677901 INSPEC Abstract Number: C2003-08-6160-009

Title: Efficient processing of XPath queries using indexes

Author(s): **Chen, Y.** ; Madria, S.; Passi, K.; Bhowmick, S.

Author Affiliation: Dept. of Comput. Sci., Missouri Univ., Rolla, MO, USA

Conference Title: Database and Expert Systems Applications. 13th International Conference, DEXA 2002. Proceedings (Lecture Notes in Computer Science Vol.2453) p.721-30

Editor(s): Hameurlain, A.; Cicchetti, R.; Traunmuller, R.

Publisher: Springer-Verlag, Berlin, Germany

Publication Date: 2002 Country of Publication: Germany xviii+951 pp.

ISBN: 3 540 44126 3 Material Identity Number: XX-2002-02754

Conference Title: Database and Expert Systems Applications. 13th International Conference, DEXA 2002. Proceedings

Conference Date: 2-6 Sept. 2002 Conference Location: Aix-en-Provence, France

Language: English

Subfile: C

Copyright 2003, IEE

Author(s): **Chen, Y.** ; Madria, S.; Passi, K.; Bhowmick, S.

...Abstract: XML and semistructured data. All these query languages make use of regular path expressions to **query** XML data. To **optimize** the processing of **query** paths a number of indexing schemes have also been proposed. XPath provides the basis for...

19/3,K/3 (Item 3 from file: 2)

DIALOG(R) File 2:INSPEC

(c) 2006 Institution of Electrical Engineers. All rts. reserv.

07240032 INSPEC Abstract Number: C1999-06-6160B-023

Title: On the query optimization in multidatabases

Author(s): **Chen, Y.** ; Benn, W.

Author Affiliation: Dept. of Comput. Sci, Chemnitz-Zwickau Tech. Univ., Chemnitz, Germany

Conference Title: Cooperative Databases and Applications. Proceedings of the International Symposium on Cooperative Database Systems for Advanced Applications p.84-91

Editor(s): Kambayashi, Y.; Yokota, K.

Publisher: World Scientific, Singapore

Publication Date: 1997 Country of Publication: Singapore xv+574 pp.

ISBN: 981 02 3161 X Material Identity Number: XX-1998-03303

Conference Title: Proceedings of the International Symposium on Cooperative Database Systems for Advanced Applications

Conference Date: 5-7 Dec. 1996 Conference Location: Kyoto, Japan

Language: English

Subfile: C

Copyright 1999, IEE

Title: On the query optimization in multidatabases

Author(s): **Chen, Y.** ; Benn, W.

Identifiers: **query optimization ;**

19/3,K/12 (Item 2 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci
(c) 2006 The Thomson Corp. All rts. reserv.

01737189 Genuine Article#: HW915 No. References: 22
Title: A PICTORIAL APPROACH TO POOR-QUALITY COST MANAGEMENT
Author(s): **CHEN YS ; TANG K**
Corporate Source: LOUISIANA STATE UNIV,DEPT QUANTITAT BUSINESS ANAL/BATON
ROUGE//LA/70803
Journal: IEEE TRANSACTIONS ON ENGINEERING MANAGEMENT, 1992, V39, N2 (MAY)
, P149-157
Language: ENGLISH Document Type: ARTICLE (Abstract Available)

Author(s): **CHEN YS ; TANG K**
Research Fronts: 90-1378 001 (RELATIONAL DATABASE; **QUERY OPTIMIZATION**
; NULL VALUES; COMPLEX OBJECTS)

ALOG(R)File 65:Inside Conferences
(c) 2006 BLDSC all rts. reserv. All rts. reserv.

04629669 INSIDE CONFERENCE ITEM ID: CN048383658
EnsMart-A query optimized database and a genomic integration platform
Kasprzyk, A.; Clamp, M.; Andrews, D.; **Chen, Y.** ; Clarke, L.; Cox, T.;
Cuff, J.; Curwen, V.; Coates, G.; Cutts, T.
CONFERENCE: Genome informatics-Meeting
ABSTRACTS OF PAPERS PRESENTED AT THE MEETING ON GENOME INFORMATICS , 2003
P: 8
Cold Spring Harbor Laboratory, 2003
LANGUAGE: English DOCUMENT TYPE: Conference Abstracts and program
CONFERENCE SPONSOR: Cold Spring Harbor Laboratory
CONFERENCE LOCATION: Cold Spring Harbor, NY 2003; May (200305) (200305)

EnsMart-A query optimized database and a genomic integration platform
Kasprzyk, A.; Clamp, M.; Andrews, D.; **Chen, Y.** ; Clarke, L.; Cox, T.;
Cuff, J.; Curwen, V.; Coates, G.; Cutts, T.

19/3,K/16 (Item 1 from file: 144)
DIALOG(R)File 144:Pascal
(c) 2006 INIST/CNRS. All rts. reserv.

12944709 PASCAL No.: 97-0217478
Magic sets and stratified databases

CHEN Y

Technical Institute of Changsha, Hunan, China

Journal: International journal of intelligent systems, 1997, 12 (3)
203-231

Language: English

Copyright (c) 1997 INIST-CNRS. All rights reserved.

CHEN Y

English Descriptors: Stratification; **Optimization ; Query formulation ;**
Labelling; Deductive database; Information processing; Time complexity

Set	Items	Description
S1	20	JOIN() PREDICAT?
S2	5214	QUER??? ?(10N)OPTIMIZ?
S3	2486	UNION()ALL()VIEW??? ? OR UNIONALLVIEW? OR UNIONALL()VIEW??? ? OR UNIONALL? OR UNION()ALL? ?
S4	32	LOCAL() PREDICAT?
S5	24	JOIN???() PREDICAT?
S6	0	(S1 OR S5) (100N) S3
S7	1	(S1 OR S5) (100N) S4
S8	4	S2 (100N) S5
S9	0	S2 (100N) S3
S10	0	S3 (100N) S4
File	9:Business & Industry(R)	Jul/1994-2006/Jul 24 (c) 2006 The Gale Group
File	13:BAMP	2006/Jul W3 (c) 2006 The Gale Group
File	15:ABI/Inform(R)	1971-2006/Jul 24 (c) 2006 ProQuest Info&Learning
File	16:Gale Group PROMT(R)	1990-2006/Jul 24 (c) 2006 The Gale Group
File	47:Gale Group Magazine DB(TM)	1959-2006/Jul 24 (c) 2006 The Gale group
File	75:TGG Management Contents(R)	86-2006/Jul W3 (c) 2006 The Gale Group
File	88:Gale Group Business A.R.T.S.	1976-2006/Jul 13 (c) 2006 The Gale Group
File	98:General Sci Abs	1984-2005/Jan (c) 2006 The HW Wilson Co.
File	141:Readers Guide	1983-2006/Jun (c) 2006 The HW Wilson Co
File	148:Gale Group Trade & Industry DB	1976-2006/Jul 24 (c) 2006 The Gale Group
File	160:Gale Group PROMT(R)	1972-1989 (c) 1999 The Gale Group
File	239:Mathsci	1940-2006/Sep (c) 2006 American Mathematical Society
File	275:Gale Group Computer DB(TM)	1983-2006/Jul 24 (c) 2006 The Gale Group
File	369:New Scientist	1994-2006/Jul W1 (c) 2006 Reed Business Information Ltd.
File	370:Science	1996-1999/Jul W3 (c) 1999 AAAS
File	484:Periodical Abs Plustext	1986-2006/Jul W3 (c) 2006 ProQuest
File	553:Wilson Bus. Abs.	1982-2006/Jul (c) 2006 The HW Wilson Co
File	621:Gale Group New Prod. Annou. (R)	1985-2006/Jul 24 (c) 2006 The Gale Group
File	624:McGraw-Hill Publications	1985-2006/Jul 25 (c) 2006 McGraw-Hill Co. Inc
File	634:San Jose Mercury	Jun 1985-2006/Jul 24 (c) 2006 San Jose Mercury News
File	635:Business Dateline(R)	1985-2006/Jul 22 (c) 2006 ProQuest Info&Learning
File	636:Gale Group Newsletter DB(TM)	1987-2006/Jul 24 (c) 2006 The Gale Group
File	647:CMP Computer Fulltext	1988-2006/Aug W3 (c) 2006 CMP Media, LLC
File	674:Computer News Fulltext	1989-2006/Jul W3 (c) 2006 IDG Communications
File	696:DIALOG Telecom. Newsletters	1995-2006/Jul 24

(c) 2006 Dialog

7/3,K/1 (Item 1 from file: 275)
DIALOG(R) File 275:Gale Group Computer DB(TM)
(c) 2006 The Gale Group. All rts. reserv.

02057104 SUPPLIER NUMBER: 19036817 (USE FORMAT 7 OR 9 FOR FULL TEXT)
DB2's outer join. (SQL enhancements in DB2 for MVS/ESA Version 4.1) (Product
Announcement)

Favero, Willie
Enterprise Systems Journal, v11, n12, p42(42)
Dec, 1996

DOCUMENT TYPE: Product Announcement ISSN: 1053-6566 LANGUAGE:
English RECORD TYPE: Fulltext; Abstract
WORD COUNT: 2791 LINE COUNT: 00240

... keyword is repeated, followed by the third table and another ON
clause for each additional **join predicate**. Notice the improved
readability in Example 5, a three-way outer join.

The ON clause does not preclude the use of the WHERE clause for
specifying additional **local predicates**. Remember, though, that the join
is always performed before applying the WHERE predicates.

There are...can be specified.

Nested table expressions can improve the readability of a complex
join. Specifying **local predicates** within the nested table expression
makes a three-or-more table join easier to debug. The **local predicates**
for the table are declared where the table name is specified. The **join
predicate** is specified for each table pair with the ON clause, again where
the table name...

8/3,K/1 (Item 1 from file: 88)
DIALOG(R)File 88:Gale Group Business A.R.T.S.
(c) 2006 The Gale Group. All rts. reserv.

05607812 SUPPLIER NUMBER: 67183803
Iterative Dynamic Programming: A New Class of Query Optimization Algorithms.
KOSSMANN, DONALD; STOCKER, KONRAD
ACM Transactions on Database Systems, 25, 1, 43
March, 2000
ISSN: 0362-5915 LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 16550 LINE COUNT: 01391

... shared join columns since such experiments are part of the standard repertoire to validate a **query optimizer**. Again, we will not show the results of these experiments here because they only confirmed...

...100 different settings for the cardinality of the base tables and the selectivity of the **join predicates**. These settings were made randomly following the approach proposed in Steinbrunn et al. (1997). Using...

8/3,K/2 (Item 2 from file: 88)
DIALOG(R) File 88:Gale Group Business A.R.T.S.
(c) 2006 The Gale Group. All rts. reserv.

05446689 SUPPLIER NUMBER: 62793341
Optimization and Evaluation of Disjunctive Queries.
Claussen, Jens; Kemper, Alfons; Moerkotte, Guido; Peithner, Klaus;
Steinbrunn, Michael
IEEE Transactions on Knowledge and Data Engineering, 12, 2, 238
March, 2000
ISSN: 1041-4347 LANGUAGE: English RECORD TYPE: Abstract

AUTHOR ABSTRACT: It is striking that the **optimization** of disjunctive
queries --i.e., those which contain at least one or-connective in the query
predicate--has...

...join operators that produce two output streams: the true-stream with
tuples satisfying the selection (**join**) **predicate** and the false-stream
with tuples not satisfying the corresponding predicate. Splitting the tuple
streams...

8/3,K/3 (Item 3 from file: 88)
DIALOG(R)File 88:Gale Group Business A.R.T.S.
(c) 2006 The Gale Group. All rts. reserv.

05291549 SUPPLIER NUMBER: 58224700
Optimization of Queries with User-Defined Predicates.
CHAUDHURI, SURAJIT; SHIM, KYUSEOK
ACM Transactions on Database Systems, 24, 2, 177
June, 1999
ISSN: 0362-5915 LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 21496 LINE COUNT: 01766

... execution plan very close to the optimal. This heuristic serves as an excellent alternative where **query** size or complexity of the optimization algorithm is a concern.

Our techniques provide optimization algorithms for queries containing user-defined selections as well join **predicates**. In the rest of this paper, we use the term user-defined predicate (or expensive...

...generically refer to any user-defined predicate whether it occurs as a selection or a join **predicate**. In contrast, we reserve the term "join **predicate**" to refer to traditional join **predicates** in **queries**.

We implemented the **optimization** algorithms by extending a System R style optimizer. We present worst-case complexity analysis and...
...traditional framework and the extensions needed to handle user-defined predicates (selections as well as join **predicates**) in **query optimization**. In Section 3, we review the System R **optimization** algorithm (Selinger et al. 1979), which is the basis of many commercial optimizers. Next, we describe the desired execution space and review past work on **optimizing queries** with user-defined predicates. Sections 4 and 5 present the two optimization algorithms that find...
THEOREM 6.4 The total number of subplans that need to be stored by the **optimization** algorithm with complete rank ordering where a **query** has user-defined selection predicates but no user-defined join **predicates** is no more than $(2.\sup{n})((1 + w/2).\sup{g})$.

PROOF. We store...

...most $(1 + k/2)(2.\sup{n})$. The next theorem presents the complexity of the **optimization** algorithm with complete rank ordering when a **query** has user-defined join **predicates** as well.

THEOREM 6.5 The total number of subplans that need to be stored by the **optimization** algorithm with complete rank-ordering where a **query** has both user-defined selections and join **predicates** is no more than $(2.\sup{n})((1 + w).\sup{u})$.

PROOF. The proof is...

8/3,K/4 (Item 4 from file: 88)
DIALOG(R)File 88:Gale Group Business A.R.T.S.
(c) 2006 The Gale Group. All rts. reserv.

05118561 SUPPLIER NUMBER: 54776361
Optimization Techniques for Queries with Expensive Methods.
HELLERSTEIN, JOSEPH M.
ACM Transactions on Database Systems, 23, 2, 113
June, 1998
ISSN: 0362-5915 LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 20197 LINE COUNT: 01648

... the following, we refer to a Boolean factor of the query's where clause. A **join predicate** is one that refers to multiple tables, and a selection predicate refers only to a single table.

2.1.1 Selectivity. Traditional **query optimizers** compute selectivities for both joins and selections. That is, for any predicate p (join or...

...et al. 1988; Haas et al. 1995). Accurate selectivity estimation is a difficult problem in **query optimization**, and has generated increasing interest in recent years.(1) In Illustra, selectivity estimation for user ...

...create function command (Illustra 1994). In this article we make the standard assumptions of most **query optimization** algorithms, namely, that estimates are accurate and predicates have independent selectivities.

2.1.2 Differential...

...system such as Illustra, arbitrary user-defined methods may be introduced into both selection and **join predicates**. These methods can be written in a general programming language such as C, or in...primary join predicates. Merge join, hash join, and index nested-loop join all have primary **join predicates** implicit in their processing. **Join predicates** that are not applicable in processing the join are merely used to select from its output, and we refer to these as secondary **join predicates**. Secondary **join predicates** are essentially no different from selection predicates, and we treat them as such. These predicates...

...pulled up above higher join nodes, just like selection predicates. Note, however, that a secondary **join predicate** must remain above its corresponding primary join. Otherwise the secondary **join predicate** would be impossible to evaluate.(3)

2.2 Optimal Plans for **Queries** with Expensive Predicates

At first glance, the task of correctly **optimizing queries** containing expensive predicates appears exceedingly complex. Traditional **query optimizers** already search a plan space that is exponential in the number of relations being joined...

...explore the issue of ordering selections among joins. Since we will eventually be applying our **optimization** to each plan produced by a typical join-enumerating **query optimizer**, our model here is that we are given a fixed join plan, and want to...

...the joins. This section develops a polynomial-time algorithm to optimally place selections and secondary **join predicates** in a given join plan. In Section 2.5 we show how to efficiently integrate...among joins appears in the next section.

Table III. Performance of Plans for Example 2

Optimization Time		
Query Plan	CPU	Elapsed
Without Pred. Mig.	0.10 sec	0.10 sec
With Pred. Mig...		

...section we presented the Predicate Migration Algorithm, an algorithm for optimally placing selection and secondary **join predicates** within a plan tree. If applied to every possible join plan for a query, the Predicate Migration Algorithm is guaranteed to generate a minimum-cost plan for the **query**.

A traditional **query optimizer**, however, does not enumerate all possible plans for a **query**; it does some pruning of the plan space while enumerating plans (Selinger et al. 1979...).

...join plan enumeration, it can significantly lower the amounts of space and time required to **optimize queries** with many joins. The pruning in a System R-style **optimizer** is done by a dynamic programming algorithm, which builds optimal plans in a bottom-up...primary join predicate constrained to precede all of S', or a selection or secondary join **predicate** that is unconstrained with respect to all of S'. Thus parallel ...

...as "interesting orders" (Selinger et al. 1979).

(8) In fact, the pioneering designs in query "**optimization**" were more accurately described by their authors as schemes for "**query decomposition**" (Wong and Youssefi 1976) and "access path selection" (Selinger et al. 1979).

(9) Note that...

...an appropriate approach from a practical standpoint, since it preserves the behavior of the optimizer **on queries without expensive predicates**.

(13) In this particular query **the** plan chosen by PullUp took almost 100 times as long as the optimal plan, although...

...poor performance happened because PullUp pulled the costly selection on T2 above the costly join **predicate**. The result of this was that the costly join **predicate** had to be evaluated on all tuples in the Cartesian product of T4 and the subtree...